Implicit gambling attitudes in problem gamblers: Positive but not negative implicit associations

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A b s t r a c t

Background and objectives: Implicit attitudes (associations) are involved in the generation of substance use behaviors. However, little is known about the role of this automatic cognitive processing in deregulated behaviors without substance use, such as abnormal gambling. This study examined whether problem gamblers exhibit both positive and negative implicit attitudes toward gambling-related stimuli. Methods: Twenty-five problem gamblers and 25 control participants performed two unipolar (pleasant; unpleasant) Single-Target Implicit Association Tasks (unipolar ST-IAT), in which gambling pictures were associated with either pleasant (or unpleasant for the negative unipolar ST-IAT) or neutral words. Explicit attitudes toward gambling were also recorded. Results:We found in problem gamblers: (i) both positive implicit and explicit attitudes toward gambling; (ii) no negative implicit gambling association; (iii) that only positive explicit attitudes positively correlated with the gambling severity score. Limitations: (i) the use of only one type of reaction time task; (ii) the use of both words and pictures in a same IAT; (iii) problem gamblers have been compared to non-gamblers instead of being contrasted with healthy non-problem gamblers. Conclusions: Whereas our gamblers experienced deleterious effects related to gambling, implicit attitude toward gambling remained positive, thus hampering attempts to quit gambling. Possible clinical interventions targeting implicit cognition in problem gamblers were discussed.

1. Introduction

Why do gamblers continue to gamble despite of the occurrence of associated negative consequences? We addressed this question in focusing on implicit attitudes toward gambling in a sample of gamblers who encountered and reported problem gambling. Implicit attitudes tend to reveal automatic, impulsive mental processes are supposed to overcome some of the intrinsic limitations of self-report measures (e.g., De Houwer, Crombez, Koster, & De Beul, 2004). Implicit measures would be less susceptible to self-presentation or deception when they are used to assess socially sensitive or stigmatized issues, such as addiction. In contrast with substance addiction (for a review see, Wiers & Stacy, 2006), little is known about implicit attitudes in problem gambling. Indeed, so far, only one study has directly investigated implicit attitude toward gambling in problem gamblers (Yi & Kanetkar, 2010). In this study, problem gamblers held more positive attitudes toward gambling than did both non-problem gamblers and non-gamblers. In other terms, in these gamblers, negative consequences had no impact on positive-gambling associations. However, a limitation of Yi and Kanetkar's study (2010) was that they used a bipolar version of the Implicit Association Task (IAT), which measures the relative implicit attitude toward gambling (i.e., gamblers hold stronger positive than negative association toward gambling). In order to track possible state of dual-attitudes (both positive negative) toward gambling (i.e., ambivalence), we used a unipolar variant of the IAT that presents the attribute dimension in a unipolar format (Houben & Wiers, 2008). Specifically, while the bipolar IAT contrasts two attribute categories with each other (e.g., positive vs. negative), unipolar IATs contrast the same attribute categories with neutral categories (e.g., positive vs. neutral and negative vs. neutral). This methodology will then make possible to investigate possible ambivalence, which has been recognized as an important feature of addictive behaviors (Miller & Rollnick, 1991).

Our main hypothesis was that although problem gamblers exhibit stronger positive than negative association with gambling, the negative side of implicit processing is present and may reflect the implicit signature of a state of ambivalence.

2. Methods

2.1. Participants

Participants were 25 problem gamblers (PrG) and 25 nongamblers participants. All subjects were adults (>18 years old). They all provided informed consent that was approved by the appropriate human subject committee at the Brugmann University Hospital. The demographic data for the two groups are described in Table 1.

2.2. Recruitment and screening methods

Gamblers were recruited through advertisement in the casino complex VIAGE, Brussels, Belgium. The ads asked for participants who “gambled frequently” to participate in a one day study to explore factors associated with gambling. In order to exclude occasional or non-frequent gamblers, a telephone screening interview was conducted by means of a locally developed screening tool, which included an examination of frequency of gambling behavior and comorbid psychiatric disorders. We excluded any subject who had a) over than 65 years, b) experienced either a substance use disorder during the year before enrollment into the study. Participants were judged to be medically healthy on the basis of the results of their medical history. Substance use and medical history were examined on the basis of items taken from the Addiction Severity Index Short Form. In addition, participants were asked to avoid alcohol consumption for the preceding 24 h of the testing. Gambling dependence severity was assessed with the South Oaks Gambling screen (SOGS; Lesieur & Blume, 1987). All PrG (n ¼ 25) scored _ 3 on the SOGS, indicative of problem gambling, and 15 participants (60% of the whole sample) met the more stringent criteria for probable pathological gambling (SOGS _ 5).

For instance, all participants who scored _ 5 and 4 participants (40%) who scored _ 3 on the SOGS respond “Yes” for the item “Do you feel you have ever had a problem with betting or money gambling?”. Controls were recruited by word of mouth from the employees belonging to the psychiatric department of the Brugmann University Hospital. To avoid biases, resulting from inside knowledge of how these tasks operate, psychiatrists, psychologists and other personnel having had psychological training were excluded from participation.

2.3. Current clinical status

Current clinical status of depression and anxiety was rated with French versions of the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and the Spielberger Statee Trait Anxiety Inventory (STAI; Spielberger, 1983), respectively.

2.4. Positive and negative unipolar ST-IAT

Participants performed a positive and a negative unipolar Single Target IAT (ST-IAT; Houben & Wiers, 2008). The «gambling» target category consisted of 5 gambling pictures (label «gambling»). Gambling pictures consisted of 5 full color photographs (height ¼ 3.15 inches, width ¼ 2.17 inches), each of them depicting one gambling-related object (i.e., slot machine; cards; casino chips; roulette; dice). Pictures appeared in the center of a 17 inch screen. In the positive unipolar ST-task variants, the positive attribute category (label «pleasant»), consisting of 5 positive words and the neutral attribute (label «neutral») consisted of 5 neutral words. Further, in the negative unipolar task variants, the negative attribute category (label «unpleasant») consisted of 5 negative words and the neutral attribute (label «neutral») consisted of 5 neutral words. The number of letters and frequency of positive, negative and neutral words (see Appendix A) were selected with Wordgen (Duyck, Desmet, Verbeke, & Brysbaert, 2004). The pleasant unipolar ST-IAT and the negative unipolar ST-IAT consisted of 4 blocks. In both unipolar ST-IAT variants, participants first practiced the

attribute classification (pleasant vs. neutral or unpleasant vs. neutral) during which all attribute stimuli were presented twice. Next, they received the combination block during which gambling target and attribute stimuli were presented twice for a total of 40 trials. Participants then practiced the reversed attribute discrimination, followed by the reversed combination block. Key assignment (i.e., lefteright) and order of combination block (i.e., neutral or pleasant/unpleasant vs. gambling; gambling or pleasant/ unpleasant vs. neutral) were randomly counterbalanced for one half of the participants, and no significant effect of key assignment and order of combination block was found.

2.5. Explicit gambling-related attitudes

Explicit gambling-related attitudes were assessed with the Gambling Attitudes and Beliefs Scale (GABS; Breen & Zuckerman, 1999). The GABS is a 35-items scale, which is anchored by strongly disagree and strongly agree (4-point scale). GABS items were constructed to capture a wide array of positive evaluation of gambling (e.g., “Gambling makes me feel alive”), cognitive biases and irrational beliefs (e.g., “Sometimes I just know I am going to have good luck”), and chasing behaviors (e.g., “If I lose, it is important to stick with it until I get even”). According to Breen and Zuckerman (1999), the GABS is characterized by a unidimensional construct, which can be interpreted as a general affinity to gambling. Participants first received the two unipolar ST-IAT and then problem gamblers received the GABS.

3. Results

3.1. Demographics and current clinical status (see Table 1)

Depression was higher in PrG than in controls, t(49) ¼ _2.91, $p < 0.01$. State and Trait anxiety was higher in the PrG group in comparison with the control group, t(49) ¼ _2.74, $p < 0.01$; t(49) ¼ _2.79, $p < 0.01$, respectively. Importantly, comparisons between PrG and

controls on the positive unipolar ST-IAT remained statistically significant when potentially confounding variables (depression, trait and state anxiety) were individually entered as covariate into the statistical model.

3.2. Positive and negative unipolar ST-IAT

Unipolar ST-IAT effects were calculated with the D600 scoring algorithm (Greenwald, Nosek, & Banaji, 2003). For the positive and negative unipolar ST-IATs, the D600 measurewas calculated so that higher scores indicate faster performance when gambling was paired with pleasant or unpleasant attributes, respectively. Further, following the formula presented by Greenwald et al. (2003), practice trials were always included, error penalties (600 ms) were given, and results were standardized at the level of the participant.

Preparatory analyses revealed no influential outliers on unipolar ST-IAT data. On the basis of Karpinski and Steinman's method (2006), unipolar ST-IAT measures revealed an acceptable level of internal consistency (Positive, adjusted r ¼ 0.73; Negative, adjusted r ¼ 0.71).

In problem gamblers, with respect to the positive and negative unipolar IAT, results showed that negative unipolar ST-IAT effects were not significant, t(24)¼_1.11, p ¼ 0.29, while positive unipolar ST-IAT effects were significant, t(24) ¼ 2.16, $p < 0.05$. Hence, these findings demonstrate positive implicit gambling associations in problem gamblers but not negative implicit gambling associations when implicit associations with gambling were assessed relative to neutral words. In the control group we observed no significant effect for both positive and negative unipolar ST-IAT, t(24)¼ _1.18, p ¼ 0.24; t(24) ¼ 0.86, p ¼ 0.52, respectively. Furthermore, a oneway ANOVA revealed a group difference between controls (M ¼ _0.15, SD ¼ 0.62) and gamblers (M ¼ 0.36, SD ¼ 0.83) participants on D600 scores for the positive unipolar ST-IAT, F(1,49) ¼ 5.64, $p < 0.05$, but not for the negative unipolar ST-IAT (controls: M ¼ 0.18, SD ¼ 0.78; problem gamblers: M ¼ 0.14, SD ¼ 0.68; $F < 1$).

3.3. Explicit gambling-related attitudes

In problem gamblers (M ¼ 2.67, SD ¼ 0.07), a one sample t-test revealed that mean scores on the GABS were significantly different from the midpoints (i.e., 2.5), t(24) ¼ 2.10, p < 05, which indicated positive explicit attitudes toward gambling in problem gamblers.

This score was also positively correlated with SOGS scores, r(25) ¼ 0.51, p < 0.01.We found no significant correlation between the GABS (i.e., explicit cognition) and the positive unipolar ST-IAT (i.e., implicit cognition), r(25) ¼ 0.19, p ¼ 0.41. There was also no significant correlation between the SOGS and performances on the positive unipolar ST-IAT, r(25) ¼ 0.31, p ¼ 0.13. In addition, regression analyses carried out in problem gamblers showed that positive and negative ST-IAT scores did not add to the contribution of gambling problems after controlling for explicit attitude scores (see Table 2).

4. Discussion

In this study, we found that, compared with non-gamblers, problem gamblers exhibit positive, but not negative, implicit attitudes toward gambling-related pictures. Positive explicit attitudes toward gambling, which correlates with problem gambling, also characterized problem gamblers.

Our results add important information to a previous study showing positive implicit associations in problem gamblers (Yi & Kanetkar, 2010). Because of our choice to use a unipolar measure of implicit attitudes, we ruled out the possibility that problem gamblingwas associated with both positive and negative automatic associations. This finding is important because in our gamblers sample, participants had experienced a number of deleterious consequences in relation to their gambling behaviors (e.g., most participants agreed with the assumption that they feel that they ever had a problem with betting or money gambling). Importantly, we found no sign of dual implicit (both positive negative) attitudes

in problem gamblers toward their gambling behaviors. One explanation could be that at the time of the experiment, problem gamblers did not “really” make the connection between these negative outcomes and their gambling behaviors. This might reflect impaired self-awareness in problem gamblers (e.g., Brevers et al., 2012), which could possibly hamper their ability to recognize the severity of their disorder (i.e., lack of insight; Goldstein et al., 2009) and would make initial and salient positive implicit gambling associations and gambling behaviors unchanged. Thus, positive implicit and explicit attitudes toward gambling might be one of the driving forces behind the persistence of gambling despite the occurrence of severe deleterious consequences. What could be made for generating negative associations with gambling? Intervention strategies aimed to reducing the salience of gambling behaviors by acting through the modification of both explicit and implicit attitudes toward gambling is an option. For instance, implicit stereotypes (e.g., black þ unpleasant; white þ pleasant) can be modified through implementation intentions (e.g., Stewart & Payne, 2008). Implementation intentions (Gollwitzer,1993) are if-then plans that supplement goal intentions (e.g., «Gambling is not good for me») by specifying (i) a good opportunity to act (e.g., «If gambling and negative appear together.»), and (ii) a consistent goal-directed response to that opportunity is encountered (e.g., «. then I respond especially fast to gambling words and negative words!»). Thus, one may expect that cognitive interventions, such as implementation intentions, alter the strength of implicit positive gambling associations, which may in turn lead to changes in the motivation process (e.g., more ambivalence) that could lead to a behavioral update. Future works should address this important clinical issue.

Some limitations should be noted. First, an alternative explanation of current results is that the negative unipolar ST-IAT used in this study was not sensitive enough to detect a negative implicit association toward gambling in problem gamblers. Indeed, IAT is a relative rather

than an absolute measure in that it does not exclusively measures the association between concepts (e.g., De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009). For instance, Bluemke and Friese (2006) found stronger IAT effects in East German participants in conditions with in group-congruent target stimuli (e.g., West-positive, East-negative) and/or in groupcongruent attribute stimuli (e.g., positive-West, negative-East). In this context, the chances of finding implicit negative associations toward gambling in problem gamblers during a negative unipolar ST-IAT might be larger with negative gambling-congruent target stimuli (e.g., pictures related to the loss) and/or negative gambling congruent attribute stimuli (e.g. the word "loss"). As a second limitation, we used both words (i.e., positive, negative and neutral attributes) and pictures (i.e., gambling target) stimuli, which is contestable. Indeed, there is evidence that, compared with words, pictorial stimuli more directly activate the associated attitude in memory (e.g. De Houwer & Hermans, 1994). Hence, present IAT scores might be less reliable that those obtained with the use of words or pictures stimuli only. Third, despite acceptable internal consistency of the current ST-IAT, the use of only one type of reaction time (RT) task is a limitation. For instance, the use of only one RT did not allow the estimation of measurement error of multiple reaction time tasks (Cunningham, Preacher, & Banaji, 2001). Moreover, Houben, Nosek, and Wiers (2010) reported that drinking behavior is better predicted by bipolar IAT as compared with unipolar IAT. Therefore, it would be advisable to examine implicit attitudes toward gambling with both bipolar and unipolar IAT in a same study design. Fourth, in this paper, because of the absence of non-problem gamblers (most of our controls were nongamblers), we cannot isolate the "problem gambling" component per se. This limits the generalizability of our results. Finally, due to small sample size, non-significant results (e.g., no significant correlation between SOGS scores and performances on positive unipolar IAT) must be interpreted with caution.

In conclusion, we found no evidence of negative associations with gambling in a sample of gamblers who experienced negative consequences in relation to their gambling behaviors.

Declaration of interest

This study does not report on treatment for gambling nor does it advocate for the use of specific medication in the treatment of gambling addiction.

Disclosures of interest include that Damien Brevers is Research Fellow of F.R.S-FNRS. Axel Cleeremans is a Research Director of the F.R.S-FNRS. Helen Tibboel is a Research Fellow of the Special Research Fund of Ghent University. Xavier Noël is a Research Associate of the F.R.S-FNRS.

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Appendix A. Attribute stimuli

Positive: plaisir (pleasure), liberté (freedom), loisir (leisure), joie (joy), amis (friends).

Negative: dégout (disgust), ennui (boredom), douleur (pain), colère (anger), tristesse (sadness).

Neutral: général (general), régulier (regular), normal (normal), banal (banal), commun (common).

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